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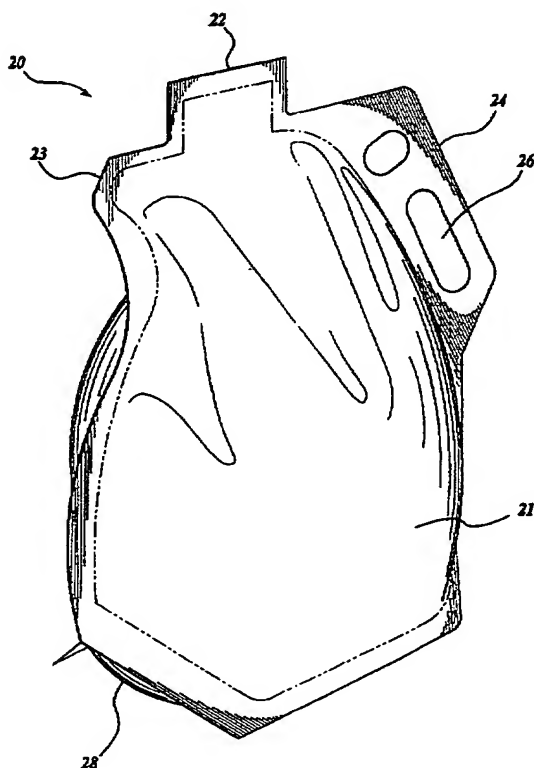
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(54) Title: COMBINATION STORAGE PACKAGING FOR CONCENTRATED/POWDERED MATERIAL AND CONTAINER FOR PRODUCT PREPARED THEREFROM AND METHOD OF USING PACKAGING/CONTAINER



(57) Abstract: A container for a dehydrated or otherwise concentrated product and for the hydrated/reconstituted product made therefrom has a first sheet section that forms the body of the container, a second sheet section that forms bottom of the container. The sheet is made from material containing at least 30% by weight a mineral based material.

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COMBINATION STORAGE PACKAGING FOR CONCENTRATED/POWDERED
MATERIAL AND CONTAINER FOR PRODUCT PREPARED THEREFROM AND
METHOD OF USING PACKAGING/CONTAINER

5 CROSS-REFERENCE TO RELATED APPLICATION

This application claims priority from U.S. Provisional Patent Application No. 60/235,690, filed on September 27, 2000 under 35 U.S.C. § 119(e).

FIELD OF THE INVENTION

10 Packaging and storage of concentrated liquids and solids and the hydrated/reconstituted product thereof.

BACKGROUND OF THE INVENTION

Many products, especially beverages, such as fruit juice, milk, proportionally are
15 largely composed of substantially inert liquids, such as water. Correspondingly, the proportion of solid material comprising beverage products is quite small. For various reasons, such as reduced cost of transportation, ease of transportation and storage and the extension of shelf life, such products are dehydrated wherein the inert liquids are extracted. Such products are reduced into concentrated liquids or solidified before
20 distribution. The dehydrated liquids or solids are transported through the product distribution chain, eventually arriving at repackaging/bottling plants or consuming locations. At these locations, the products are rehydrated, whereat inert liquids, such as water, are added into the dehydrated liquids or solids to restore the original products.

Many other products, including medicines and chemicals, are made from
25 precursors in liquid or solid forms. The desired end products are prepared by mixing the precursors with additional liquids, often water or alcohol. Reference to "concentrated liquids or solids" in this application means liquids or solids having less liquids than the hydrated, rehydrated, reconstituted or desired products. The hydrated, rehydrated, reconstituted or desired products are the end products for use or consumption. The
30 concentrated liquids or solids can be produced by a dehydration process from the hydrated products or from precursors. The rehydration process in this invention refers to any processes where a liquid is added to a concentrated liquid or solid.

The rehydration process can be carried out at a central location near consumers, such as at a local bottling company, at a restaurant, or at other consuming sites, such as a consumer's home, a camping ground, a hospital room or a research laboratory. The rehydration process usually involves measuring the correct amount of concentrated liquid or solid and the correct amount of the diluting liquid, then mixing them together in a suitable container. If the amount of hydrated product is large, it may need to be divided into smaller sized containers for consumption and/or storage for future consumption.

Many steps in the rehydration process, such as measuring of the concentrated solid or liquid, measuring the diluting liquid, transferring concentrated solid or liquid between different containers, etc. are not very convenient to perform. In this regard, a measuring cup may be hard to locate when a crying baby wants formula or a patient urgently requires medicine. The accuracy of the measurement can be a problem in many circumstances. Also, inadvertent spills of concentrated liquid or solid powder when pouring from bottles into cups or other mixing containers may be messy.

Various devices have been developed in an attempt to address the different aspects of the rehydration process. For example, small amounts of instant coffee powder are packaged in packets for a certain sized cup. For consumption, the packet is opened and then the coffee powder is poured into a cup. Water is added to fill the cup and the mixture stirred to make a cup of coffee. No measuring of the coffee powder or water is necessary. But the concentrated liquid or powder still needs to be poured into a separate mixing and drinking cup of the proper size. Also, this process is environmentally wasteful if a disposable mixing/drinking cup is used.

A disposable cup has been used as the package for the concentrated liquid or solid, so no additional cup is necessary. Water is added to the cup to produce the desired product. But the cup typically significantly increases the volume of the package for the concentrated liquid or solid because the cup must have sufficient volume to accommodate the end product. The relatively large volume or size of the cup reduces the benefit of using a concentrated liquid or solid.

Instead of a rigid cup, the package for concentrated liquids or solids can be composed of a flexible material and function as an insert for another container serving as a shell. To produce the product from the concentrated liquid or solid, the flexible package is placed in the shell container. The package is opened and water or other

diluting liquid is added to the package. The shell container provides support and protection for the end product.

The forgoing packaging materials are typically composed of paper, plastic, or a combination thereof. Paper is a natural product and environmental friendly. But paper is usually not very strong. Also, it is a poor liquid or vapor barrier. Plastic, such as polyolefin, is durable, strong, and a good barrier for liquid or vapor. But plastic can be very slow to decompose, thereby accumulating in landfills and causing environmental problems.

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SUMMARY OF THE INVENTION

The present invention advantageously provides a package for concentrated liquids or solids and the rehydrated products thereof. The package can be made from a sheet material folded and then sealed along all margins. The sheet material contains at least about 30 percent a mineral based material by weight. The package can have a resealable spout and/or a handle.

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BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing aspects and many of the attendant advantages of this invention will become more readily appreciated as the same become better understood by reference to the following detailed description, when taken in conjunction with the accompanying drawings, wherein:

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FIGURE 1 is an isometric view of a first embodiment of the current invention, shown as holding a rehydrated product;

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FIGURE 2 shows a flat sheet that can be used to construct the first embodiment of the current invention shown in FIGURE 1;

FIGURE 3 is an isometric view of another embodiment of the current invention shown as filled with a rehydrated product;

FIGURE 4 shows a flat sheet that can be used to construct the embodiment of the current invention shown in FIGURE 3.

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FIGURES 5-10 show schematic views of a method of continuously constructing and using an embodiment of the current invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

FIGURE 1 is an isometric view of a first embodiment of the present invention, including a container 20 holding a rehydrated product. The container 20 has a body 21 section and a bottom 28 section. A spout 22 extends upwardly from the top of the body 21, a side spout 23 is on the shoulder of the body 21, and one or more finger holes 26 are positioned between the body 21 and a handle bar 24.

FIGURE 2 is a plane view of a flat sheet 50 that can be used to construct the container 20 shown in Figure 1, where the panels have not yet been folded and the margins thereof have not yet been sealed.

FIGURES 3 and 4 show another embodiment of the present invention in the form of a container 30. The container 30 is essentially constructed from a flat sheet 40. The flat sheet 40 is generally rectangular in shape, and thus has a top, a bottom and two sides. The top has a top margin or edge portion 32 extending therealong. The bottom has a bottom margin or edge portion 38 extending therealong and the two sides have side margins or edge portions 34 and 36. The flat sheet 40 also has a fold line 31 extending along longitudinally between two panels 41 and 42 comprising the sheet. When the flat sheet 40 is folded along the fold line 31, the two side margins 34 and 36 of panels 41 and 42, respectively, meet, and the two panels define a space therebetween. When the overlapping margins of the two panels are sealed together, i.e., margin 34 to margin 36, the top margin 32 of panel 41 to the top margin 32 of panel 42, and the bottom margin 38 of panel 41 to the bottom margin 38 of panel 42, a sealed space is formed in between the two panels forming the container 30. The margins along fold line 31 can also be sealed.

When the concentrated liquid or solid alone is stored in container 30, the container is essentially flat. It can be rolled or folded further to reduce its size if the sheet material is sufficiently flexible. When the diluting liquid is added to the container 30, the container expands and becomes generally pillow-shaped, as shown in FIGURE 3. Designed with a spout, this type of container can conveniently be used as a portion pack that can easily be carried about, e.g., in a person's pocket or handbag.

Rather than constructing the container 30 with two panels 41 and 42 by folding the flat sheet 40 over on itself, the panels 41 and 42 can be individual members, e.g. provided from one or more continuous webs, that are sealed together along their margins.

When the flat sheet is cut into certain shapes or patterns, a more useful container can be formed. In an embodiment of the current invention shown in FIGURE 2, flat sheet 50 is cut into a specific shape. The flat sheet 50 is shaped to define three panels: a first or left hand side panel 100, a second or right hand side panel 200 and a third bottom panel 300. The left side panel 100 and right side panel 200 are generally rectangular in shape and form the body of the container 20. The third panel 300 forms the bottom of the container 20 and is generally elliptical in shape.

The left side panel 100 has a left margin 122, a top section, a right margin 124 opposite to the left margin and also shares a fold line 126 with the adjacent margin 224 of the right side panel 200, and a bottom section which shares a fold line 128 with the bottom panel 300. The top section of panel 100 has sequential margin segments 102, 103, 104, 106, 108, 112, 114 and 116 which extend from the left margin 122 to the right margin 124. The bottom section of the left side panel 100 has sequential margin segments 132, 134 and 136 that extend from the left margin 122 to the right margin 124.

Similarly, the right side panel 200 has a left margin 224, which shares the fold line 126 with the adjacent margin 124 of left side panel 100. Panel 200 also has a right margin 222 opposite left margin 124, a top section and a bottom section. The top and bottom sections of panel 200 are mirror images of the top and bottom sections of panel 100. Similar to the left panel 100, the top section of the right side panel 200 has sequential margin segments 202, 203, 204, 206, 208, 212, 214 and 216. Also, the bottom section of the right side panel has sequential lower margin segments 242, 244 and 246.

At the top section of the left side panel 100, margin segments 106, 108 and 112 cooperatively define an upwardly extending protrusion or spout section 110. Similarly, at the top section of the right side panel 200 the margin segments 206, 208 and 212 cooperatively define an upwardly extending protrusion or spout section 210. On the left shoulder of the left side panel 100, the margin segment 103 together with the corresponding margin segment 203 on the right shoulder of the right side panel 200 can conveniently form a side spout.

The left side panel 100 also has an oblong hole 156, outwardly adjacent and extending along margin segment 116. The outer edge portion of this margin section is identified by part numbers 152 and 154. The right hand side panel 200 has a matching oblong hole 256, outwardly adjacent and extending along margin 216. The outer edge

portion of this margin section is identified by part numbers 252 and 254. The left side panel 100 has a second, generally round hole 159 positioned just upwardly of the oblong hole 156. Correspondingly, a generally round hole 259 is formed in the marginal portion of panel 200 just above oblong hole 256. When the container 50 is assembled, as
5 discussed below, the holes 159 and 259 are in registry, and the holes 156 and 256 are in registry. The hole 159/259 can conveniently receive the forefinger of the user, and the oblong hole 156/256 can conveniently receive the middle, ring and/or small fingers of the user.

The bottom panel 300 has a marginal section 334, which shares a fold line 128
10 with margin 134 of left panel 100. The bottom panel 300 also has margin segments 332 and 336 that extend diagonally away from margin section 334. The bottom panel 300 further has margin segments 342, 344 and 346 that correspond with margin sections 332, 334 and 336. A fold line 340 longitudinally divides the bottom panel 300.

Although the margin segments 334 and 134 do not necessarily have to be straight,
15 preferably at least a central portion of these margin segments is substantially straight and generally parallel to fold line 340. Similarly, margin segment 344 along the distal portion of the bottom panel 300, and margin segment 244 at the bottom of the right side panel 20, also are preferably centrally substantially straight and parallel to fold line 340. It is further preferred, but not essential, that margin segments 336 and 346 of bottom
20 panel 300 form an angle, which may be about 90 degrees and bisected by fold line 340. Similarly, margin segments 332 and 342 preferably form an angle, which may be about 90 degrees and is bisected by fold line 340.

When the container 20 is assembled from flat sheet 50, the panels are folded along fold lines 126, 128 and 340 and then all the matching margin segments the three panels
25 are sealed together. There are many ways to carry out the sealing process, whether by chemical or physical procedures. Perhaps one of the easiest physical techniques is by heat sealing using well known equipment and techniques. In this regard, heat is applied to the margin segments of the panels, fusing the sheets together to create a fluid tight seal. An example of a chemical technique is to use an adhesive to seal the corresponding
30 margin segments together. The corresponding margin segment pairs between the left side panel 100 and the right side panel 200 include: 102/202, 104/204, 106/206, 108/208, 112/212, 114/214, 116/216, 124/224, 122/222, 152/252, 154/254. The corresponding

margins between the left side panel 100 and the bottom panel 300 include: 136/336, 134/224, 132/332. Also the corresponding margins between the right side panel 200 and the bottom panel 300 include: 242/342, 244/344, 246/346. The matching holes are 156/256, 159/259. The margins along fold lines 126 and 128 may or may not be sealed.

Rather than employing the fold lines 126 and 128, the panels 100, 200 and/or 300 could be joined together along other marginal portions thereof, thereby to define other fold lines. For example, rather than being joined to panel 100, panel 200 could be joined to panel 300 wherein the intersection between bottom margin 244 of panel 200 and the distal margin 344 of panel 300 could define a fold line therebetween. In addition, the three panels 100, 200 and 300 could be formed as separate sheets that are joined together along their corresponding margins.

According to another embodiment of the current invention, the two side panels are connected to the third bottom panel but not to each other directly. In this arrangement, the flat sheet 50 and the container 20 can be advantageously constructed by a continuous process, as shown in Figures 5-10. The flat sheet 50 can be eventually cut from an endless sheet material. A roll of such endless sheet material is shown in Figure 5. The endless sheet can be folded along the longitudinal axis to form a W-shaped endless sheet, which has two outer layers and two inner layers, as shown in Figure 6. The outer layers will become the two side panels 100 and 200 of the flat sheet 50 and the inner layers will become the bottom panel 300 of the flat sheet 50. In this arrangement, the first and second side panels 100 and 200 do not share a common fold line, but each of them shares a common fold line with the bottom panel 300. The shared fold lines are between margin segments of 134/334 and 244/344.

The W-shaped endless sheet will be punched and "welded" by heat sealing or other processes into the shape of a side panel of flat sheet 50. Each individual flat sheet is still connected to each other in the W-shaped sheet, as shown in Figure 7. All the corresponding side margins are welded or otherwise sealed to form container 20, except the seals at the spouts on top of the flat sheet 50, as in Figure 1. After containers 20 are formed on the W-shaped endless sheet, the W-shaped endless sheet is rolled back into a roll composing of many containers 20, as shown in Figure 8. The roll of endless sheet of container 20 can then be used in a continuous filling machine to be filled-in with the

concentrated liquids or solids, as shown in Figure 9. After each container 20 is filled with correct amount of concentrated liquids or solids, the individual container 20 is evacuated and sealed. The containers 20 with concentrated liquids or solids can again form a roll as in Figure 8 for storage or transportation. Or the containers can be cut out of the endless sheet as individual packages for storage, transportation or distribution, as shown in Figure 10.

In another embodiment, when all the margins are sealed together, except margin segments 108/208, the container 20 is ready for use. The container 20, as assembled, has a nominally, substantially flat profile. When the container is assembled, access to the interior of the container 20 is through the unsealed top margin segments 108/208.

To use the container 20 to store concentrated/dehydrated liquids or solids, a nozzle from a filling machine or apparatus can be inserted into the container 20 through the opening at margin segments 108/208. Once the correct amount of concentrated liquid or solid is dispensed into the container 20, the container can be evacuated and sealed at margin segments 108/208. Removing the air from the concentrated liquid or solid can result in the contents of the container to be preserved for a relatively long period of time. Depending on the volume of the concentrated liquid or solid, the container 20 can assume a relatively flat configuration and occupy minimal space when transported and/or stored.

When the contents in the container 20 are ready to be used, the seal at line 108/208 can be cut or otherwise broken. Thereafter, the container 20 can be filled with the diluting liquid (thereby expanding the container) to produce the desired product. The volume of the container 20 guarantees a correct amount of diluting liquid being filled into the container. Such guarantee of correct amount of diluting liquid is very important, especially in medical or nutrition substance applications. The spout 22 can then be closed or resealed. There are numerous ways to reseal spout 22. For example, it can be resealed with a cap, a plug or similar closure item. For a more permanent closure, a heat sealing iron can be used. Also, spout 22, formed by the protrusions 110/210, can be held pressed together with a clip or pin.

The container 20 can be shaken and/or turned upside down, etc., to mix the concentrated liquid or solid with the diluting liquid. Once the concentrated liquid or solid and the diluting liquid are well mixed, the end product is produced and ready for use. No measuring of the concentrated liquid or solid or the diluting liquid is necessary. There is

no need to transfer concentrated liquid or solid from one container to another. The end product can be retained in the same container and can be sealed therein to extend the product's useful life, or maintain the freshness of the product, such as a food product.

5 The product can be dispensed directly from the container 20 through the spout 110/210 or transferred to another container. The product can also be preferably dispensed through a side spout by cutting or tearing the container at margin segment 23, as shown in Figure 1. In this manner the container 20 can conveniently be handled like a jug when pouring the product from the container. The contents can be stored in the container 20. Due in part to the flat bottom panel 300 and/or the substantially straight,
10 parallel margin segments 134/334 and 244/344, the container 20 can sit on a flat surface by itself without having to be placed into another container. The angles formed by margin segments 332/342, 336/346 also help the ends of the bottom panel 300 to bend or extend upwardly evenly to join the adjacent margins of the panels 100 and 200, thereby leaving the rest of the container bottom 28 substantially flat and without bulges.

15 The handle 24 can be used to conveniently carry the container 20. Unlike many existing single use/single serving containers, the spout 22 can be advantageously resealed by various means to keep the contents of the container 20 fresh for an extended period of time.

Once all the contents in the container 20 have been consumed or otherwise used,
20 the container 20 can be easily flattened back to its original profile. The container 20 can be further folded or rolled into an even smaller size.

In an embodiment of the current invention, the material used to construct the container 20 may not have a "memory", so that when storing the concentrated liquid or solid, the container 20 can be rolled or folded into a smaller configuration. Also, when
25 adding the diluting liquid, the container 20 can readily expand. Later, after the restored product has been consumed or used, the container 20 can then be returned to a collapsed, flat configuration for disposal.

Also, in an embodiment according to the current invention, the material used to form the flat sheets may preferably be a combination of a mineral based filler material
30 and a plastic binding material. A mineral based filler material, such as calcium carbonate is blended with a binding material, such as polyolefin or other plastic material, to form a homogenous plastic composition material. The plastic composition material has most of

the characteristics of a plastic material, so the plastic composition material can be used in the same ways as other plastic materials are used.

For example, the plastic composition material can be formed into pellets for further applications, such as thermoforming, injection molding, film blowing or sheet extrusion. The plastic composition material can be made into homogenous films or sheets for packaging applications. The plastic composition material can be more advantageously used with other materials to form a laminated sheet material with more desirable properties for packaging applications. For example, the laminated sheet material can have an outer heat-seal layer, a plastic composition material layer, a UV barrier layer, a second plastic composition material layer, an oxygen barrier layer and a second heat-seal layer. The combined thickness of the layered material can range from 40 to 80 microns, or thinner or thicker depending on the need.

There are many advantages in using the plastic composition material of the present invention to form container 20 instead of traditional plastic material, paper or their combination in packing applications. The mineral based filler materials are in abundant supply. A large portion of the filler/binder plastic composition material consists of the mineral based filler material. The mineral based filler material can be composed of calcium carbonate, which can come from chalk or dolomite or magnesium silicate which can be derived from talc or mica, or many other mineral based materials.

The mineral based filler/binder mixture decomposes much faster than common plastic materials. Once decomposed, the bulk of the mixture, which is the mineral filler, will return to its natural state, either in solid form such as chalk or talc, or dissolved in water.

Calcium carbonate is a desired filler material because it has certain advantages. It is one of nature's own construction material, such as in egg shells. Egg shells contain about 90% calcium carbonate by weight. (Unless specified otherwise, all percentages stated herein are percentage by weight.) Once it is used, the calcium carbonate can be dissolved by water or digested by living creatures as part of their food, so that the calcium carbonate is recycled or reused by nature itself, like egg shells.

Except that it decomposes much faster than common plastic material, the plastic composition material of the present invention has most of properties of common plastics. The material can be strong like other polyolefin materials. Containers for liquid made

from plastic composition material may be relatively large, at least 2-liters in volume. The material can be very flexible. A container made from the material can be rolled or folded into small configuration. The material can have good heat-sealing properties and can be used in high speed heat-sealing packaging system. The material is an excellent barrier for liquid and gas, so a container made from the material can provide a long shelf life for the contents in the container. The material is safe and compatible with most foods or medicines and many other products. The material has excellent printability. Unlike common plastics, the material has very good cold and heat resistance properties. The material is opaque. The plastic composition material has shown excellent heat conductivity which makes it suitable for a container used for products that are to be consumed in a heated condition, such as pap for babies. A filled container can thus conveniently be heated in the microwave oven or a hot water bath, and then be used as a baby bottle. It can have high stiffness if necessary.

To achieve a greater benefit from a mineral based filler/binder mixture, the mineral based filler content should be above about 30%. The mineral based filler content should not be too high, i.e. less than 90%, otherwise the filler/binder mixture may be brittle and relatively easily breakable upon impact, like egg shells. The amount of mineral based filler material content in the resulting plastic composition material is preferably in the range of 30-70%. The range of about 50-60% of mineral based filler material in the resulting mixture is more optimal. The most desirable plastic composition material is to have about 55% mineral based material and about 45% polyolefin. When calcium carbonate is the mineral based filler material, calcium carbonate content is preferably in the range of about 50% to about 70%, with the remainder being primarily polyolefins or other suitable plastic material.

The plastic composition material is commercially available from Ecolan, under the trademark LeanMaterial.

While preferred embodiments of the invention have been illustrated and described, it will be appreciated that various changes can be made therein without departing from the spirit and scope of the invention.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A container for containing dehydrated concentrate liquid or solid and storing the hydrated product made therefrom, comprising:

a sheet folded over on itself to define at least two panels disposed in substantially face-to-face relationship to each other, the corresponding margins of the two panels sealed together to form the container; and

wherein the sheet comprising a plastic composition material comprising at least about thirty percent by weight a mineral based material.

2. A container as in Claim 1, wherein the mineral based material is calcium carbonate, magnesium silicate or mica.

3. A container as in Claim 2, wherein the plastic composition material comprising less than 70 percent a mineral based material by weight.

4. A container as in Claim 3, wherein the plastic composition material comprising 50-60 percent a mineral based material by weight.

5. A container as in Claim 3, wherein the plastic composition material comprising about 55 percent a mineral based material by weight.

6. A container as in Claim 2, wherein the plastic composition material comprising less than 90 percent calcium carbonate by weight.

7. A container as in Claim 6, wherein the plastic composition material comprising about 50-70 percent calcium carbonate by weight.

8. A container as in Claim 1, wherein the sheet further comprising at least one layer selected from a group consisting of a heat-seal layer, a UV barrier layer, and an oxygen barrier layer.

9. A container as in Claim 9, wherein the selected layer has a thickness ranging from about 40 to 80 microns.

10. A container as in Claim 1, wherein portions of the sheet define a closable spout.
11. A container as in Claim 10, further comprising a closure to close the spout.
12. A container as in Claim 11, wherein the closure is a cap.
13. A container as in Claim 11, wherein the closure is a clip.
14. A container as in Claim 1, wherein the sheet further comprising a first side panel, a second side panel and a third bottom panel;
wherein the first and second side panels are joined along a boundary, and one of the first and second side panels is joined to the bottom panel along a second boundary;
wherein the first side panel has a margin extending along the perimeter of the first panel;
wherein the second side panel has a margin extending along the perimeter of the second panel;
wherein the bottom panel has a margin extending along the perimeter of the bottom panel and a fold line extending through an intermediate location of the bottom panel;
wherein the bottom panel is folded along the fold line at the bottom panel and the margins of the bottom panel are in registry with, and sealed to, corresponding marginal portions of the first and second side panels; and
wherein the first side panel is disposed in face-to-face relationship with the second side panel and the corresponding marginal portions of the first and second side panels, that are not sealed to the marginal portions of the bottom panel, are sealed together in a liquid-impervious manner.
15. A container as in Claim 14, wherein the margins of the bottom panel comprising two substantially straight segments substantially parallel to the line of the bottom panel.
16. A container as in Claim 15, wherein the bottom panel having first end margins comprising a first pair of segments forming a substantially right angle bisected

by the bottom folding line at one end of the bottom folding line, and second end margins comprising a pair of margin segments forming a right angle bisected by the bottom folding line, at the opposite end of the bottom folding line from the first end margins.

17. A container as in Claim 16, wherein a margin of the first panel further comprising a first hole and a margin of the second panel comprising a second hole, the first and second holes located such that when the second panel is folded towards the first panel, the first hole and second hole are in registry to form a finger receiving hole and the adjacent sealed margins of the first and second panel forming a handle.

18. A container as in Claim 1, wherein the sheet further comprising a first side panel, a second side panel and a third bottom panel;

wherein the first side panel and the third bottom panel are joined along a first boundary, and the second side panel and the third bottom side panel are joined along a second boundary;

wherein the first side panel has a margin extending along the perimeter of the first panel;

wherein the second side panel has a margin extending along the perimeter of the second panel;

wherein the bottom panel has a margin extending along the perimeter of the bottom panel and a fold line extending through an intermediate location of the bottom panel;

wherein the first boundary and the second boundary are on opposite sides of the fold line on the bottom panel;

wherein the bottom panel is folded along the fold line of the bottom panel and the margins of the bottom panel are in registry with, and sealed to, corresponding marginal portions of the first and second side panels; and

wherein the first side panel is disposed in face-to-face relationship with the second side panel and the corresponding marginal portions of the first and second side panels, that are not sealed to the marginal portions of the bottom panel, are sealed together in a liquid-impervious manner.

19. A container as in Claim 18,

wherein the first and second side panels and the third bottom panel are formed from a W-shaped sheet having two outer panels and two inner panels;

the outer panels form the first and second panels;

the inner panels form the third bottom panel;

the fold line between the inner panels is the folding line of the bottom panel;

the boundaries between outer panels and inner panels are the boundaries between the side panels and the bottom panel.

20. A container as in Claim 19, wherein the two outer panels comprising two holes, one on each panel, wherein the holes are in registry to form a finger receiving hole and the adjacent sealed margins of the first and second panel forming a handle.

21. A container as in Claim 20, wherein portions of the outer panels define a closable opening.

22. A container as in Claim 19, wherein the W-shaped sheet is a roll of an endless sheet where the folding lines of inner and outer panels are along the longitudinal direction of the roll.

23. A container as in Claim 22, wherein the mineral based material is calcium carbonate.

24. A container as in Claim 23, wherein the calcium carbonate content in the plastic composition material is about 50 to 70 percent by weight.

25. A method of using a container to store a concentrated liquid or solid, and to prepare and store a reconstituted product made therefrom, comprising:

filling a container made from a plastic composition material comprised of at least 30% by weight a mineral based material, with a concentrated liquid or solid through an opening in the container;

sealing the opening for storage and/or transportation;

unsealing the opening when desiring to reconstitute the product;

adding a diluting liquid to the container;

mixing the concentrated liquid or solid with the diluting liquid in the container to produce a reconstituted product, the container usable to store the reconstituted product.

26. The method as in Claim 25, wherein the plastic composition material comprising about 50 to 70 percent a mineral based material by weight and the mineral based material is calcium carbonate.

27. The method as in Claim 25, further comprising storing the concentrated liquid or solid in the sealed container for a period of time.

28. The method as in Claim 25, further comprising resealing the container after reconstituting the product.

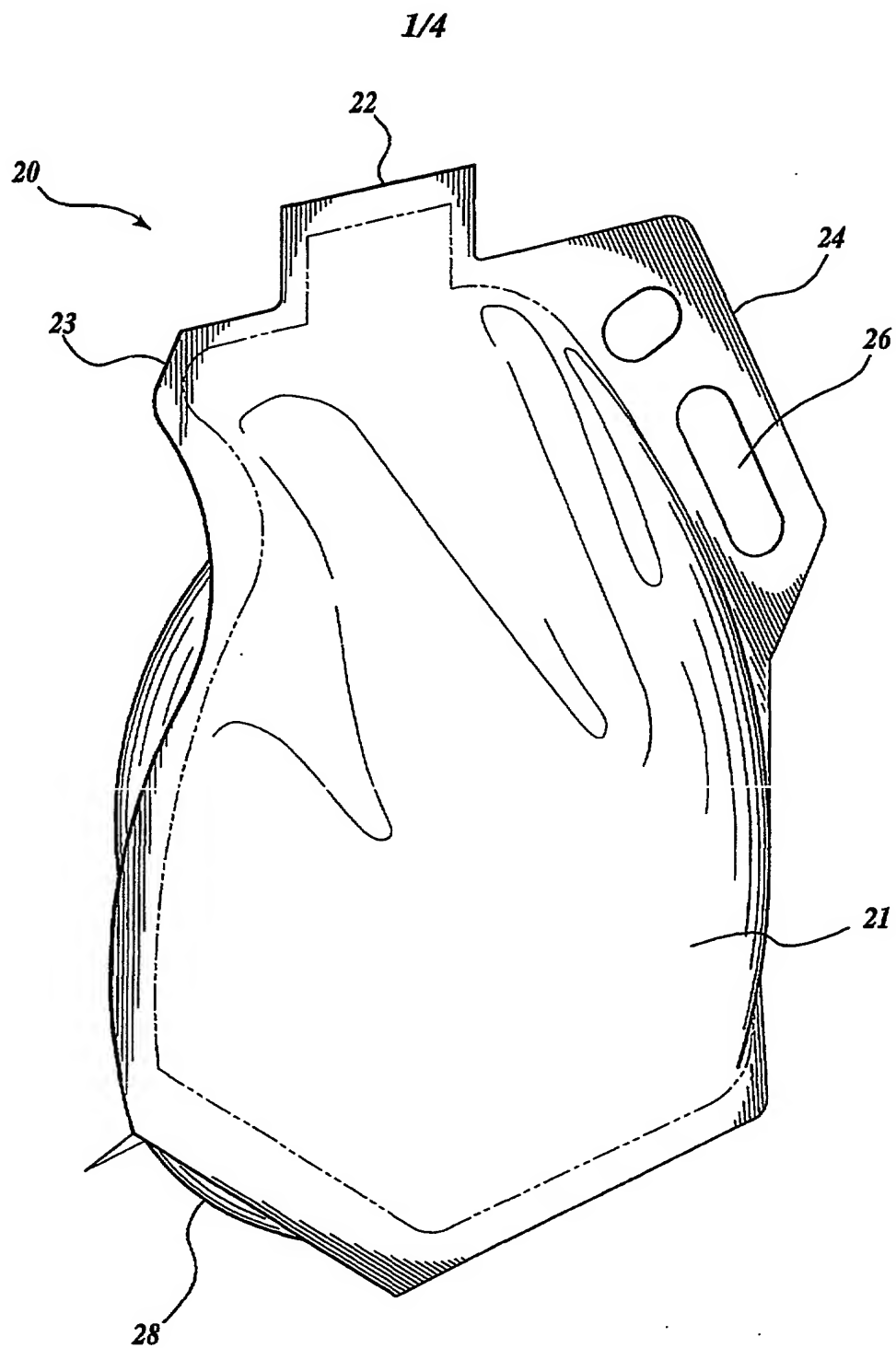


Fig. 1.

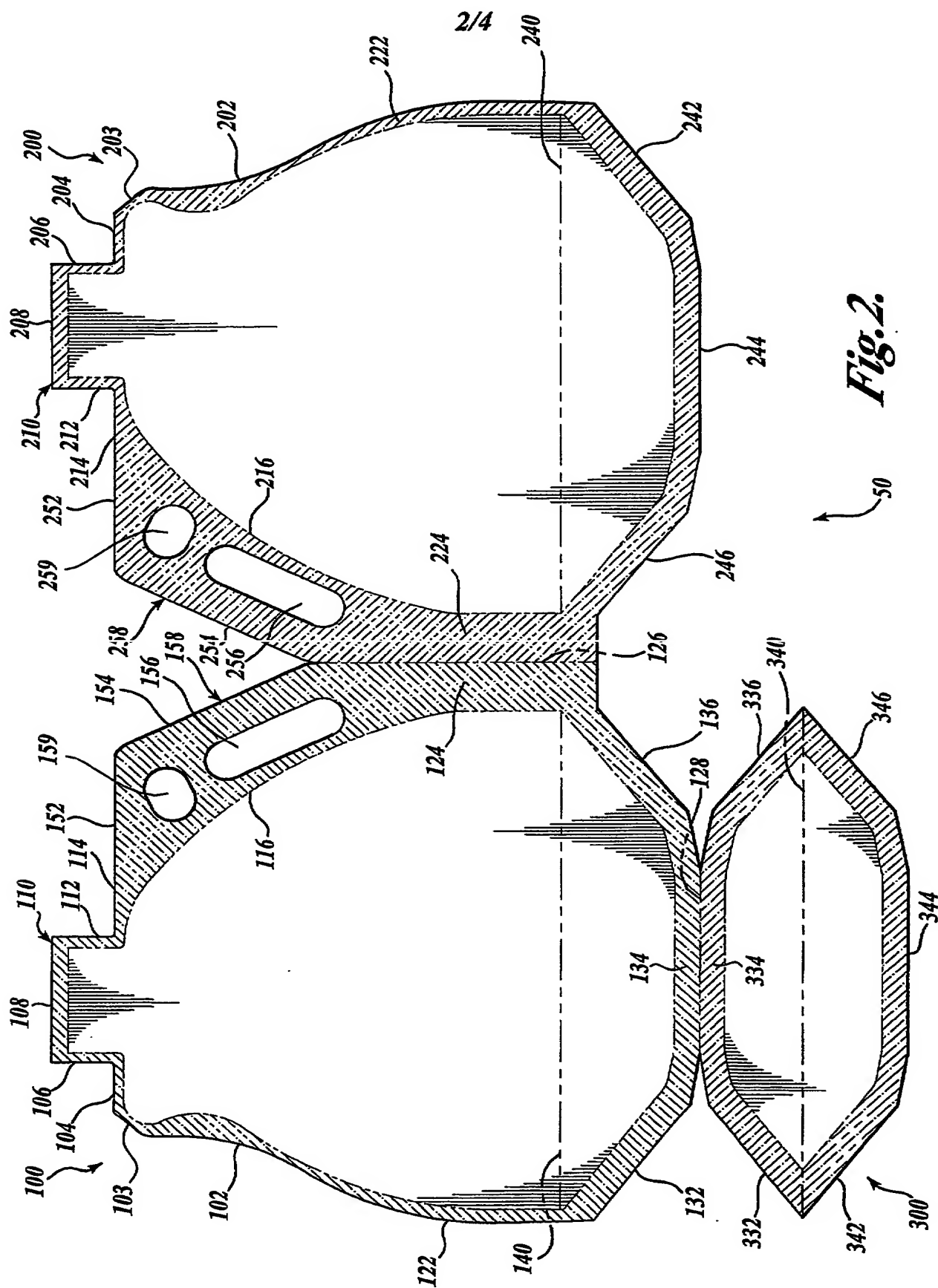


Fig. 2.

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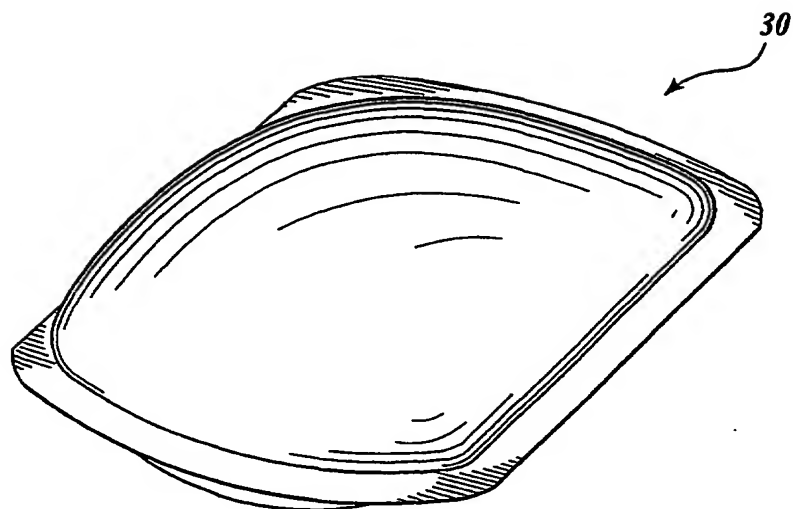


Fig. 3.

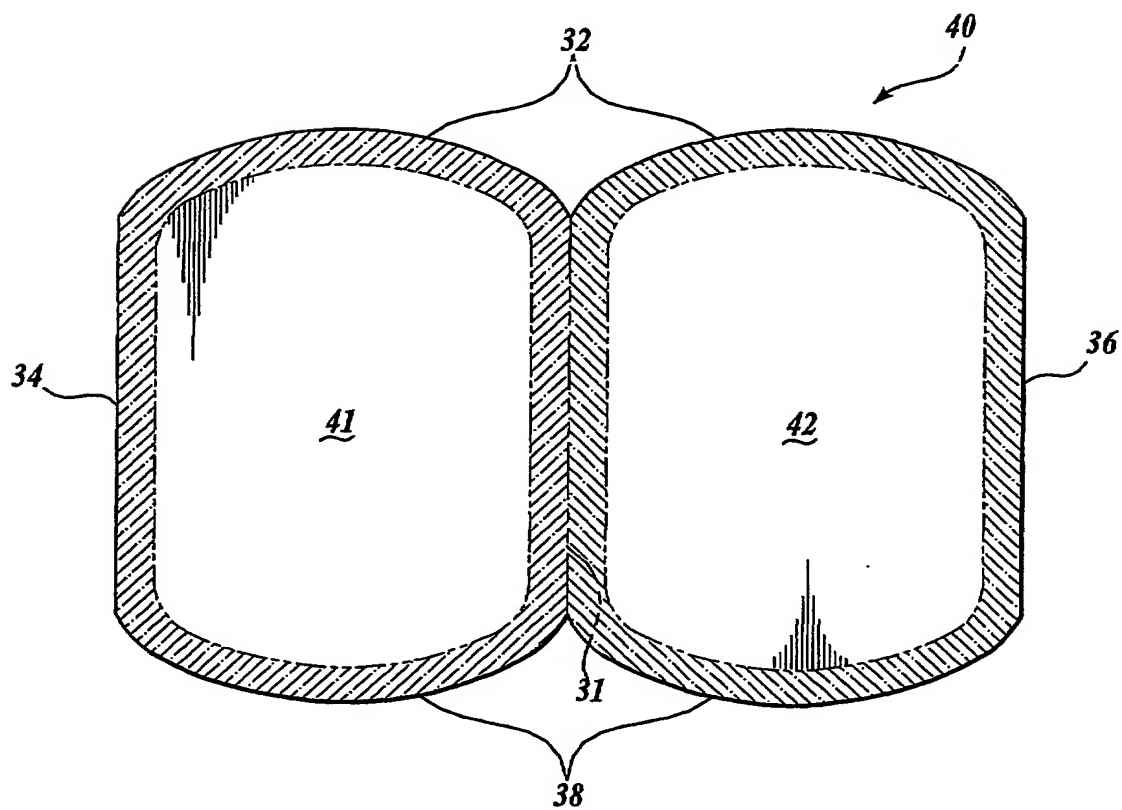


Fig. 4.

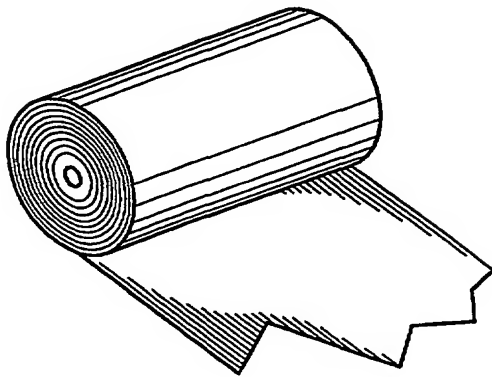


Fig. 5.

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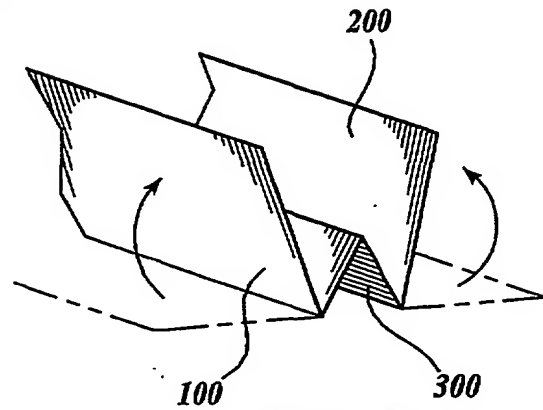


Fig. 6.

Fig. 7.

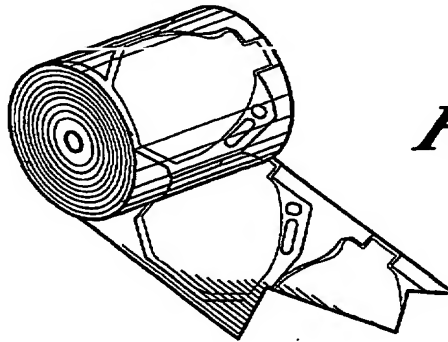
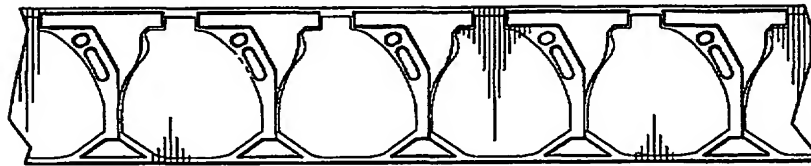


Fig. 8.

Fig. 9.

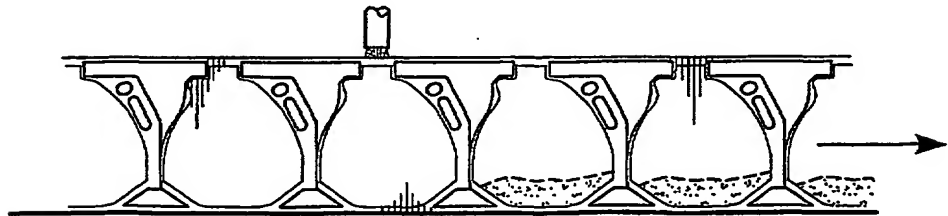


Fig. 10.

